



Health trajectories from childhood to youth: What are the drivers?

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- on behalf of the I.Family consortium -



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 266044

Building on  **ideficsstudy**

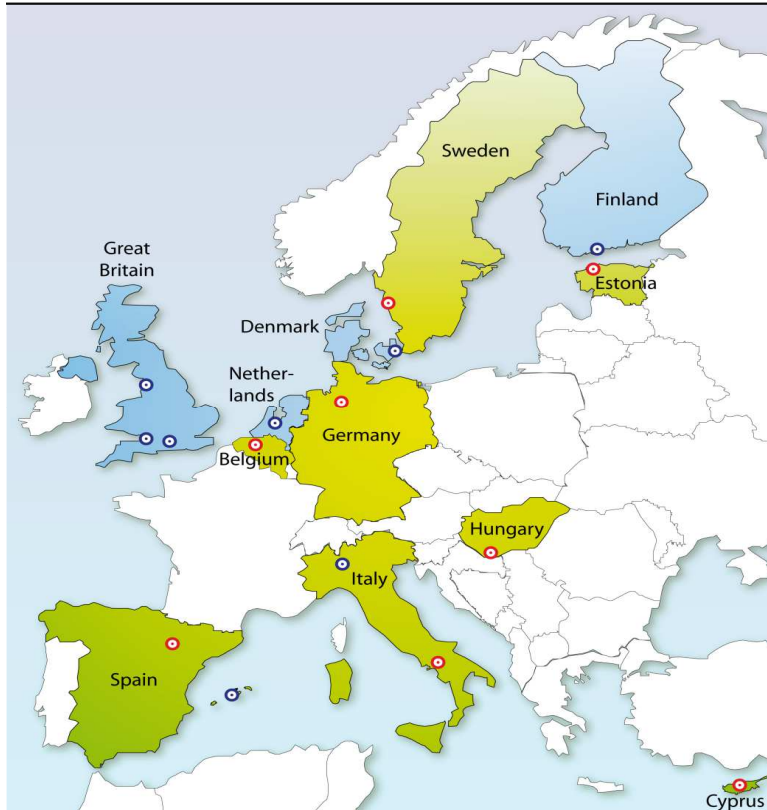


Aim:



... to contribute to reducing burden of nutrition-related diseases

- Understand interplay between **barriers and main drivers** of a healthy food choice
- Identify **predictors of unnecessary weight gain and cardio-metabolic risk** by linking them to diet, physical activity and interacting factors
 - Focus on child and his/her family
 - Assess how different factors affect children as they grow up
- Develop and convey **strategies to induce changes** towards a healthy behaviour



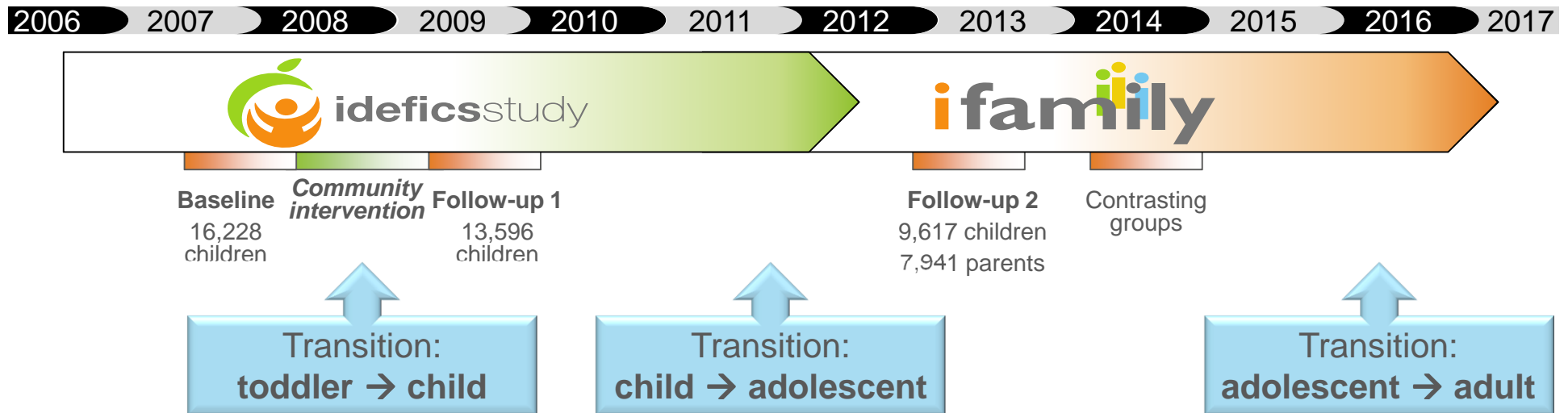
1. Strovolos, Cyprus
2. Ghent, Belgium
3. Copenhagen, Denmark
4. Tallin, Estonia
5. Helsinki, Finland
6. Bremen, Germany
7. Pécs, Hungary
8. Avellino, Italy
9. Milan, Italy
10. Utrecht, Netherlands
11. Palma de Mallorca, Spain
12. Zaragoza, Spain
13. Gothenburg, Sweden
14. Bristol, 15. Lancaster, 16. Andover, United Kingdom



Timeline of recruitment and follow-up



IDEFICS/I.Family cohort, starting with 2-10 yr olds, in 8 European countries:
Belgium, Cyprus, Estonia, Germany, Hungary, Italy, Spain, Sweden



Ahrens et al. Cohort Profile: The transition from childhood to adolescence in European children-how I.Family extends the IDEFICS cohort.
Int J Epidemiol 2017 (Epub 2016 Dec 31)

Dietary behaviour



- Children with **low socio-economic background**
 - **Persistently unhealthier dietary profiles over 2 yrs**
(Fernández-Alvira et al. Br J Nutr 2015)
- Dietary patterns (DP) **rich in fruits/vegetables, wholemeal cereals**, and low in animal products
 - **Lower risk of overweight/obesity**
 - **Less 2-year weight gain** (Pala et al. Eur J Clin Nutr 2013; Tognon et al. NMCD 2014)
- **Similar DPs** in children and parents:
 - (1) sweet/fat, (2) refined cereals, (3) animal products
 - **Familial association for sweet/fat DP more pronounced if soft drinks offered during meals** (Hebestreit, Intemann et al. Nutrients 2017)

➤ **Parents: gatekeepers** for home food availability and **role models** for children's eating behaviour

Family members resemble one another...



- ...in terms of **height, body fat** and **cardiovascular risk**
 - Resemblance **strongest for siblings**, intermediate for parent-child pairs and weakest for parental pairs (Bogl et al. Nutrients 2017)

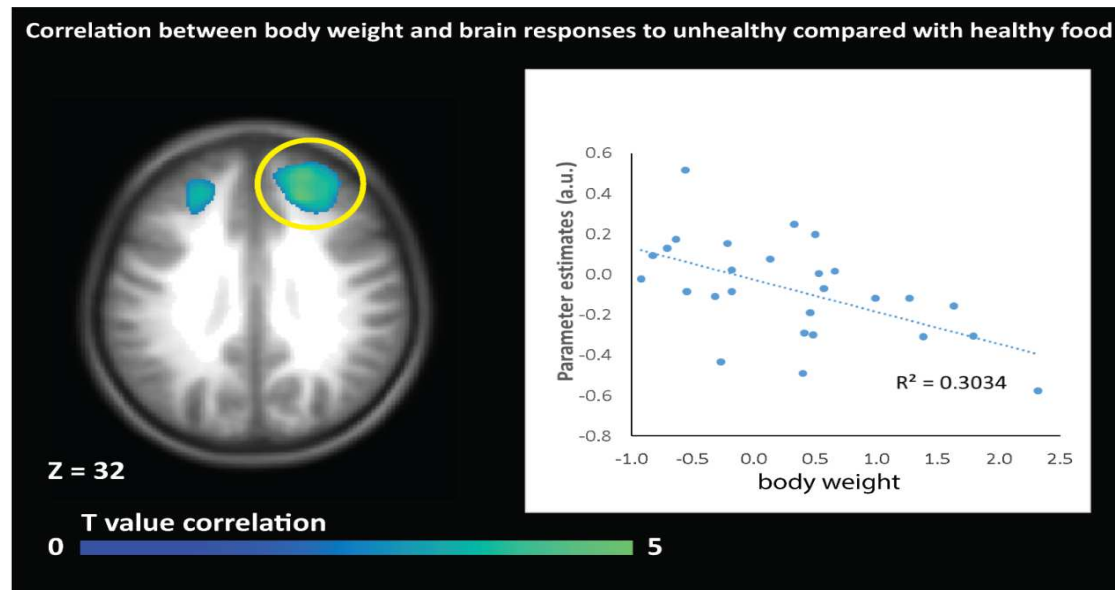
- ...in **dietary intake** (Bogl et al. Nutrients 2017)
 - Resemblance **strongest for siblings**; similar for parent-child/parental pairs
 - Similarity in healthy food intake stronger for sibling pairs than parent-child pairs

- **Peers** exhibit similar behaviour regarding consumption of **unhealthy foods**

- Familial factors explain **60% of variability intake of healthy foods**, but only **30% of intake of unhealthy foods** (Bogl et al. Nutrients 2017)

Children's food choices I

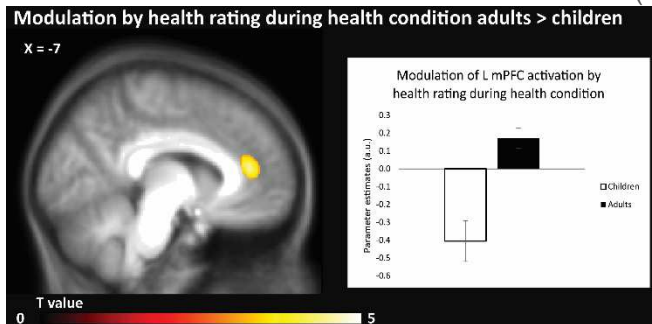
- Children are **more sensitive to unhealthy foods** than adults
 - Overweight children particularly vulnerable due to less activation in a brain area involved in cognitive control (van Meer et al. Am J Clin Nutr 2016)
 - Regulation of food marketing reasonable



Children's food choices II

- Children are **more sensitive to unhealthy foods** than adults
 - Overweight children particularly vulnerable due to less activation in a brain area involved in cognitive control (van Meer et al. Am J Clin Nutr 2016)
 - Regulation of food marketing reasonable

- **Tastiness of food predicts behaviour** and brain activation for children, even more so than for adults. For children, healthiness plays a smaller role.
 - Develop strategies to train children's preferences toward healthier foods (van Meer et al. Neuroimage 2017)





- **Short sleep duration**
 - being overweight – particularly in primary school children (Hense et al. Sleep 2011)

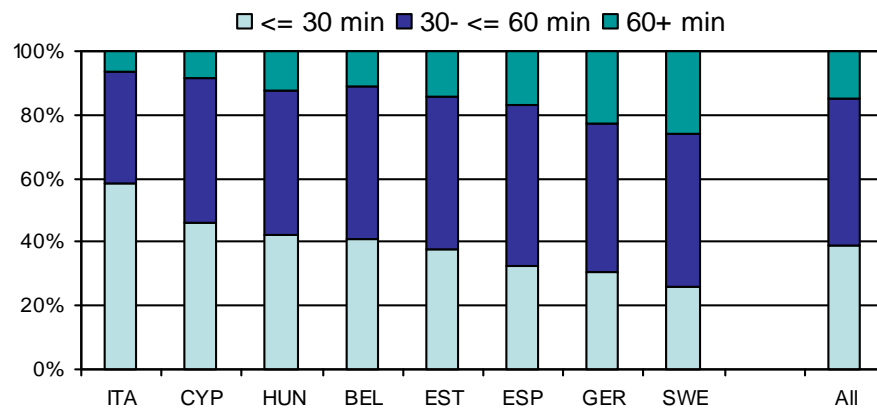
- **Inverse association** between sleep duration and BMI (Börnhorst et al. Eur J Pediatr 2012)
 - mainly explained by inverse association between sleep duration and fat mass

- Insulin may explain part of this association, in particular in heavier children (Börnhorst et al. Eur J Pediatr 2012)

Few children meet PA guidelines

(60min moderate-to-vigorous PA/day)

(Konstabel et al. Int J Obes 2014)



- **Causality** between PA and weight status **goes both ways**
 - Higher or increasing fat mass: **Decline in MVPA**
 - Just 10 minutes more MVPA/day: **Prevent excess weight gain**
- **PA < 60min/day** at baseline and follow-up
 - **increased risk of high blood pressure** (de Moraes et al. Int J Cardiol 2015)

Physical activity (PA) II

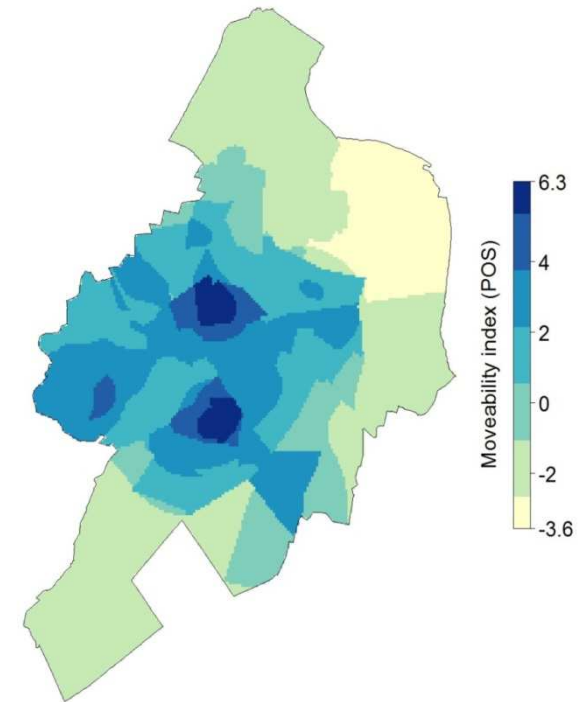


- **PA decreases as children get older...**
...and differs between countries
- **Girls are less active** than boys...
...but difference is not the same in every country
- Young people are **more active outside...**
...34% of total daily moderate-to-vigorous PA outside
- Young people are **more active** when they are **with their parents...**
....but even more active with their siblings

Built environment and physical activity (PA)



- **PA-friendliness** of built environment:
 moveability index (Buck et al. Health Place 2011)
 - **more moderate-to-vigorous PA** of 596 primary school children in German study region
- **Playground density** and density of playgrounds/parks combined
 - **positive effects on MVPA** (Buck et al. J Urban Health 2015)
- **PA declines** from childhood to adolescence, but less so in areas with high moveability
- Parental **safety concerns** limit PA, especially in girls and young children



Media consumption

- **One-third** of children **exceed screen time** recommendations (max. 2h/day) (Santaliestra-Pasías et al. Public Health Nutr 2014)
- **TV exposure** (Lissner et al. Eur J Epidemiol 2012; Olafsdottir et al. Eur J Clin Nutr 2014)
 - preference for sugary/fatty foods
 - higher consumption of sugar-sweetened beverages
 - increased risk of overweight/obesity
- **Screen time > 2h/day** at baseline and follow-up
 - increased risk of high blood pressure (de Moraes et al. Int J Cardiol 2015)
- Watching **TV during meals**, having a TV in **child's bedroom** and watching TV **more than 1h/day**
 - increased risk of being overweight/obese (Lissner et al. Eur J Epidemiol 2012)

Systemic approach needed to address...

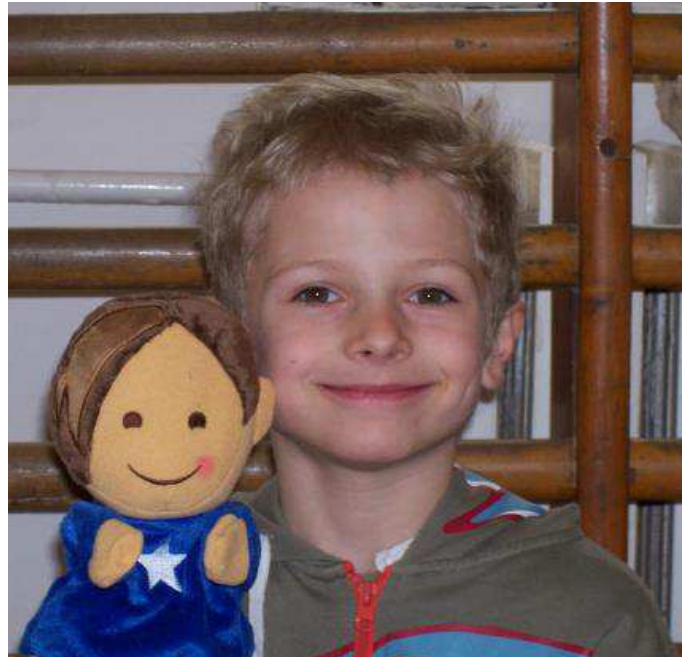


...environmental determinants of health behaviours

- To prevent obesity **health-related behaviours need to be changed** in a favourable direction
- Health behaviours are shaped by **obesogenic environment**
 - Built/ physical environment
 - Social/ cultural environment
 - Political/ regulatory environment
- Our **understanding of determinants** of diet, physical activity and sedentary behaviours **still limited**
- Future research should focus on the **forces driving our health behaviours: upstream factors**



Thank you!



Funded by the EC, FP 7, Project No. 266044 - Building on

